DRAFT
FIELD SAMPLING AND ANALYSIS PLAN

MILLER CHEMICAL FIRE RESPONSE
HANOVER, ADAMS COUNTY
PENNSYLVANIA

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1.0 INTRODUCTION

Under the Eastern Area Superfund Technical Assessment and Response Team (START) Contract No. EP-S3-10-05, Technical Direction Document No. to be determined, the U.S. Environmental Protection Agency (EPA) Region III tasked Weston Solutions, Inc. (WESTON®) to collect residential drinking water samples at residences located downstream along the Conewego Creek from the Miller Chemical Fire Site (Site) located in Hanover, Adams County, Pennsylvania. This Field Sampling and Analysis Plan (FSP) provides a description of the field activities related to this sampling event.

2.0 OBJECTIVE OF SAMPLING

The objective of this sampling event is to determine if contaminants associated with the chemical fire at the Site may have impacted residential drinking water wells. In order to meet the objective of the assessment, WESTON will collect residential well water samples residential properties located downstream of the Site along Conewego Creek. WESTON developed this Field Sampling and Analysis Plan (FSP) in accordance with the provisions of the EPA Region III START 4 Program-Wide Uniform Federal Policy-Quality Assurance Project Plan (UFP QAPP) (WESTON, 2010).

3.0 PROPOSED ACTIVITIES

This section describes the scope of work, including proposed sampling activities and field measurements; summarizes samples for the project; explains how samples will be collected and handled; and describes equipment decontamination procedures and the disposal of investigation-derived waste (IDW) generated during sampling.

3.1 SCOPE OF WORK

As part of the sampling activities for the Site, WESTON will perform the following tasks:

- Collect up to 20 residential well water samples and one field duplicate sample for each analysis.
- Collect water quality measurements with a YSI multi-parameter water quality meter
- Photo document sampling activities and sampling locations.

- Package and ship all samples collected to the assigned Tier IV laboratory (i.e., WESTON-subcontracted laboratory) for the following analyses: Anions (nitrate, nitrite, sulfate), total organic carbon (TOC), Volatile Organic Compounds (VOCs), cyanide, and Target Analyte List (TAL) Metals (excluding mercury).

3.2 SAMPLE COLLECTION

3.2.1 RESIDENTIAL DRINKING WATER SAMPLING

WESTON will collect up to 20 groundwater samples from residences in the vicinity of the Site in accordance with WESTON SOP No. 202, Residential Groundwater Sampling (WESTON, 2011a). Prior to collecting samples at each residential well, the well will be purged for approximately 15 minutes by running water from a spigot at the residence to ensure a representative groundwater sample is obtained. Samples will be collected prior to treatment from the base of holding tanks, if available, or from a location closest to the wellhead, as best as practicable. Residential drinking water samples will be collected for analysis of VOCs; nitrate, nitrite, sulfate, TOC, TAL metals, and cyanide. A table summarizing the analyses, analytical methods, containers, preservatives, QA/QC samples, and technical holding times for the samples proposed for collection during the sampling event is provided as an attachment.

3.3 SAMPLE IDENTIFICATION

The Sample Identifier will be listed on the chain-of-custody document for each sample and will provide the date and sample location as follows:

MCFR-MMDDYY-XX-###

The "MCFR" prefix refers to the Site name – Miller Chemical Fire Response. The MMDDYY refers to the date of sample collection (i.e., 070114 for July 1, 2014). The XX portion of the Sample Identifier refers to the sample type ("RW" for residential well, "TB" for trip blank). The "###" portion of the suffix refers to the unique sequential sample number assigned to a specific sampling location.

In addition to the Sample Identifier, samples to be shipped to CLP or Delivery of Analytical Services

(DAS) laboratories for analysis will be assigned unique CLP sample numbers. Organics samples will be identified in the format C#### (where the # may represent a number or letter), and the corresponding inorganics sample ID will be in the format MC####. The CLP sample number and the Sample Identifier will be included on the chain-of-custody, the bottle labels, and the sample tags attached to each bottle.

3.4 SAMPLE MANAGEMENT

WESTON will document field activities using logbooks, photographic records, and chain-of-custody documentation. Documentation, record keeping, and data management activities will be conducted in accordance with the WESTON UFP-QAPP (WESTON, 2010) and in accordance with the *Contract Laboratory Program Guidance for Field Samplers* (EPA, 2014), unless otherwise specified. Each sampling location will be noted in the field logbook in accordance with WESTON SOP No. 101, Logbook Documentation (WESTON, 2014). Scribe software will be used for sample documentation and data management.

Sample handling, packaging, and shipment procedures will be in accordance The *Contract Laboratory Program Guidance for Field Samplers* (EPA, 2014). Sample labels will be affixed to each sample jar shipped to the laboratory and sample tags will accompany each bottle. Samples will be placed in plastic zipper bags. Bagged containers will be placed in coolers with ice and packed with appropriate absorbent material. All sample documents will be sealed in a plastic zipper bag and affixed to the underside of each cooler lid. The lid will be sealed with shipping tape and custody seals will be affixed to the cooler. Coolers will be labeled with the origin and destination locations.

Chain-of-custody documents will be completed using Scribe software and will accompany field samples to the laboratory in accordance with WESTON SOP No. 103, Chain-of-Custody Documentation (WESTON, 2011b). Samples will be shipped to the designated laboratories via Federal Express. Regulations for packaging, marking, labeling, and shipping hazardous materials and wastes are promulgated by the U.S. Department of Transportation. Air carriers that transport hazardous materials require compliance with the current International Air Transport Association (IATA) regulations, which apply to shipment and transport of hazardous materials by air carrier. WESTON will follow all applicable IATA regulations.

3.5 DECONTAMINATION AND INVESTIGATION-DERIVED WASTE

Dedicated, disposable sampling equipment and personal protective equipment (PPE) will be used wherever applicable. Disposable sampling equipment and PPE will be double-bagged and disposed of as dry municipal waste.

4.0 ANALYTICAL PARAMETERS AND METHODS

All samples will be analyzed for Target Compound List (TCL) VOCs, TAL metals, Nitrate, Nitrite, Sulfate, TOC, and cyanide. A table summarizing the analyses, analytical methods, containers, preservatives, quality assurance/quality control (QA/QC) samples, and technical holding times for the samples proposed for collection during the sampling event is provided as an attachment.

5.0 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

This section describes the QA and QC procedures for personnel during the site sampling event, including responsibilities, field QC, laboratory QC, data evaluation, and data management.

5.1 FIELD QUALITY CONTROL

Field QA/QC measures will consist of collecting one field duplicate and a trip blank.

Field duplicate samples will be collected at a rate of one per 20 samples per sample matrix and will be used to test the reproducibility of sampling procedures and analytical results.

Trip blank samples will be collected and provided in each cooler containing samples for VOC analysis. Trip blank samples will be used to assess whether samples may have become cross-contaminated with VOCs during storage and shipment.

Temperature blanks will be placed in each sample cooler and used to determine whether samples have been adequately cooled during shipment and storage. The temperature blank will be prepared using tap water placed in a volatile organic analysis (VOA) vial without preservative.

5.2 LABORATORY QUALITY CONTROL

Samples will be shipped to the assigned Tier IV DAS laboratory. Laboratory QC measures will consist of all QC elements identified in the analytical method or CLP Statement of Work (SOW) as required by EPA Region III policy, and will incorporate all reportable QC (including forms and deliverables) required by the SOW, method, and this FSP.

Laboratory QC analysis of S/D samples is required for inorganic analyses. EPA Region III does not require analysis of MS/MSD samples for CLP VOCs.

S/D sample results are used to assess analytical precision and accuracy in a specific sample matrix. WESTON field personnel will collect a minimum of one S/D sample per 20 samples of the same matrix. For water samples, the S/D sample will involve the collection of a double volume of sample. See Table 2, Analytical Parameters, for a summary of QA/QC samples being collected.

5.3 DATA VALIDATION

Validation of all analytical data will be performed by the Environmental Services Assistance Team (ESAT) contractor under the direction of the EPA Region III OASQA Branch. Inorganic and organic data will be validated at the Stage 4 Validation Electronic and Manual (S4VEM) levels in accordance with USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, USEPA-540-R-08-01, June 2008 (EPA, 2008) and USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, USEPA-540-R-10-011, January 2010 (EPA, 2010).

5.4 DATA EVALUATION AND MANAGEMENT

This section describes how WESTON will evaluate data generated from the sampling event, determine whether data are representative of the Site, and make certain that data are secure and retrievable.

5.4.1 DATA EVALUATION

WESTON will review the data validation reports to determine whether any major or minor deficiencies were encountered during sampling and analysis. These deficiencies may include major

deficiencies (such as unusable or rejected data) or minor deficiencies affecting data, including data that were estimated or qualified due to failure to meet project-specific or National Functional Guideline QC acceptance limits.

To assess the effectiveness of field sampling procedures and implement corrective actions as needed, WESTON will evaluate trip blank results. Trip blank contamination not attributed to laboratory sources may be due to contamination in the field or during shipment. Failure of the temperature blank to meet the temperature acceptance criteria indicates the need to better ice down the samples.

5.4.2 DATA REPRESENTATIVENESS AND COMPLETENESS

The intent of this FSP is to obtain a complete data set that is representative of site conditions. Data will be reviewed for completeness. If not all samples were collected, resulting in less than 100% completeness, the reason for the data gaps will be identified in the a summary report. If any data are rejected, the reason for the data rejection will be discussed in the summary report. If sampling activities or procedures vary significantly from this FSP due to unexpected conditions in the field or other unforeseeable factors, WESTON will discuss these deviations from the FSP in the Trip Report and whether the changes affect data representativeness.

5.4.3 DATA MANAGEMENT

EPA Region III will provide WESTON with a validation report for the analytical data in portable document format (pdf) along with an importable Excel electronic data deliverable (EDD). WESTON will upload the EDD data to the Scribe database and compare the EDD results to the sample results received in pdf format in conjunction with the data validation report to ensure their consistency. All electronic data will be stored in a Scribe database for future retrieval and reference, based on the OSC's requirements.

5.0

6.0 REFERENCES

EPA (U.S. Environmental Protection Agency). 2008. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*. USEPA-540-R-08-01. June.

EPA (U.S. Environmental Protection Agency). 2010b. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*. USEPA-540-R-10-011. January.

EPA (U.S. Environmental Protection Agency). 2014. *Contract Laboratory Program Guidance for Field Samplers*. Office of Superfund Remediation and Technology Innovation. Office of Solid Waste and Emergency Response (OSWER) 9200.2-147 EPA 540-R-014-013. October.

WESTON (Weston Solutions, Inc.). 2010. EPA Region III START 4 Program-Wide UFP QAPP. Final. December.

WESTON (Weston Solutions, Inc.). 2011a. Residential Groundwater Sampling. SOP No. 202. August.

WESTON (Weston Solutions, Inc.). 2011b. Chain-of-Custody Documentation. SOP No. 103. August.

WESTON (Weston Solutions, Inc.). 2014. Logbook Documentation. SOP No. 101. July.

ANALYTICAL PARAMETERS TABLE

Analytical Parameters Table

Matrix	Parameter	Analytical Method	Container Type	Preservative	Detection Limit	Technical Holding Time	Number of Field Samples	Number of. Field Duplicates	Number of Designated Lab QC Samples[1]
Residential Well Water	TCL VOCs	EPA 524.2	Three 40-mL VOA vials	Ice 4°C, HCl, pH<2	RL	14 days analysis	Up to 20	1	NA
	TAL Metals*	EPA 200.8/200.7	1-L polyethylene	Ice 4°C, HNO_3 to pH <2	RL	180 days	Up to 20	1	1
	Cyanide	SM4500-CN-C/E	1-L polyethylene	Ice 4° C, NaOH to pH >12	RL	14 days	Up to 20	1	1
	Nitrate/Nitrite/Sulfate	EPA 300.0	1-L polyethylene	Ice 4° C	RL	48 hours for nitrate and nitrite 28 days for sulfate	Up to 20	1	1
	TOC	SM5310B	Three 40-mL VOA vials, no headspace	Ice 4°C, H_2SO_4 to pH<2	RL	28 days	Up to 20	1	1
Trip Blank	TCL VOCs	EPA 524.2	Three 40 mL VOA vials	Ice 4°C, HCl, pH<2	RL	14 days analysis	1 per cooler	NA	NA

Notes: TAL Metals* = TAL Metals excluding mercury.

[1] Designate 1 sample per 20 samples for inorganic laboratory QC (i.e., S/D for inorganic analysis and Lab Duplicate for TOC). Additional sample volume may not be required for the inorganic sample designated for S/D or Lab duplicate analysis based on the bottle sizes above.

EPA = United States Environmental Protection Agency
H_2SO_4 = Sulfuric acid
HCl = Hydrochloric acid
HNO_3 = Nitric acid
L = Liter
mL = milliliter
NA = Not applicable
NaOH = Sodium hydroxide
RL = Laboratory Reporting Limit
S/D = matrix spike/duplicate
TCL = Target compound list
TOC = Total Organic Carbon
VOA = Volatile organic analysis
VOC = Volatile organic compound